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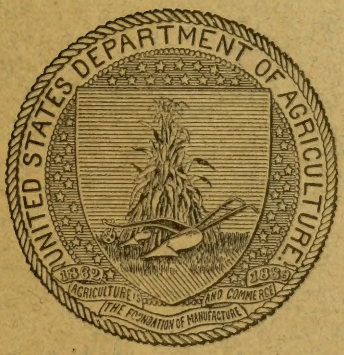
BUREAU OF PLANT INDUSTRY—BULLETIN NO. 182.
B. T. GALLOWAY, *Chief of Bureau.*

TEN YEARS' EXPERIENCE WITH THE SWEDISH SELECT OAT.

BY

MARK ALFRED CARLETON,
CEREALIST IN CHARGE OF GRAIN INVESTIGATIONS.

ISSUED SEPTEMBER 8, 1910.



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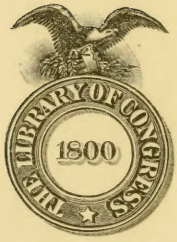

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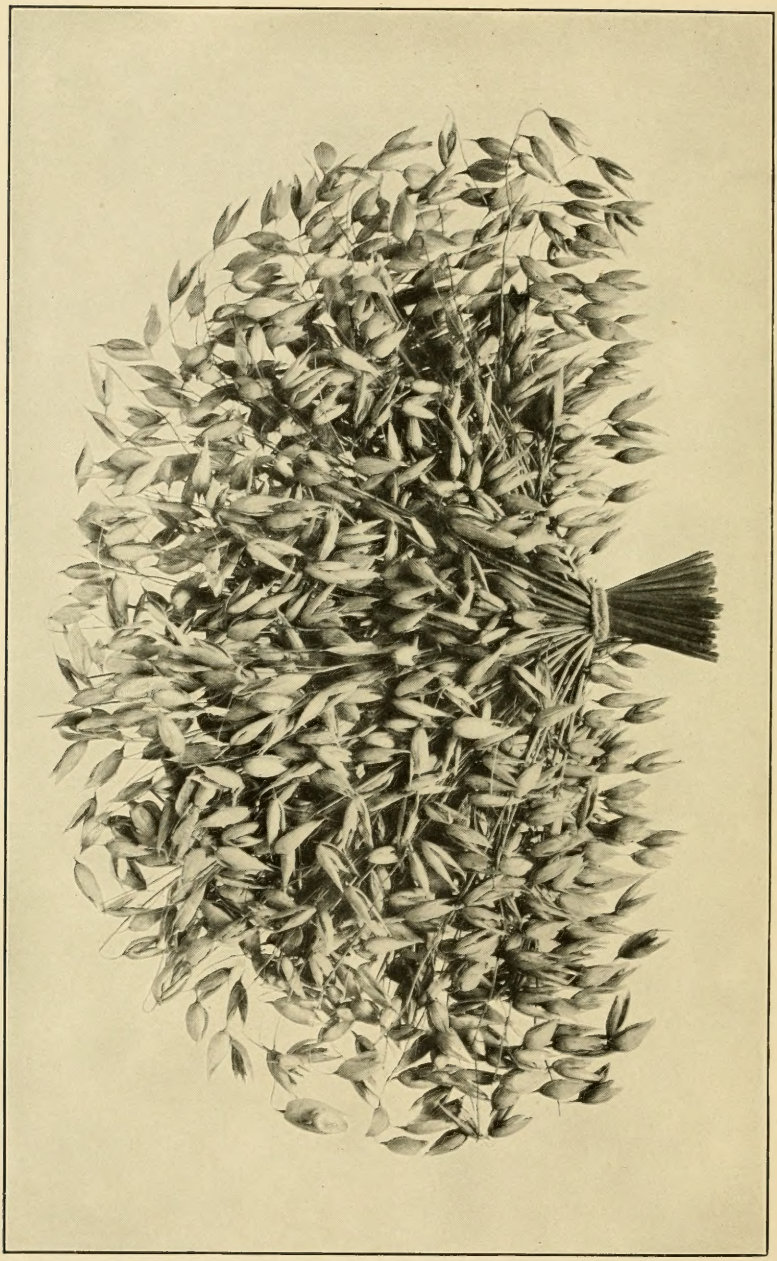

HEADS OF THE SWEDISH SELECT OAT GROWN AT SITKA, ALASKA, IN 1903.

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Bureau of Plant Industry,
Office of the Chief,
Washington, D. C., March 28, 1910.

Sir: I have the honor to transmit herewith a paper entitled "Ten Years' Experience with the Swedish Select Oat," by Mr. Mark Alfred Carleton, Cerealist in Charge of Grain Investigations, and to recommend that it be published as Bulletin No. 182 of the series of this Bureau.

Twelve years or more ago, while considerable attention was paid to the oat crop in this country, there was no definite idea of the adaptation of varieties to different portions of the United States and there was great need of varieties that would give much better results in certain localities than were obtained by those then grown. About that time several different kinds of wheat, oats, barley, and other cereals were introduced into this country, particularly from Russia. Among these was the Swedish Select oat, obtained by the writer of the accompanying paper while acting as Agricultural Explorer for this Bureau. This soon proved to be admirably adapted to the northern portion of the United States.

This paper discusses the many experiments and observations made concerning this oat at several of the experiment stations and on numerous farms during the past ten years.

Respectfully,

G. H. Powell,
Acting Chief of Bureau.

Hon. James Wilson,
Secretary of Agriculture.

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TEN YEARS' EXPERIENCE WITH THE SWEDISH SELECT OAT.

INTRODUCTION.

In the region between the Great Lakes and the Rocky Mountains one of the best-known varieties of oat at present is the Swedish Select. The annual production of this variety in the area mentioned is already at least 50,000,000 bushels, and in certain localities it has for some time entirely replaced all other kinds. It is the most popular oat in Wisconsin and adjacent districts, and the acreage sown each year has increased rapidly. Yet up to 1899 this oat was quite unknown in North America.

The Swedish Select oat was introduced into the United States by the writer in the spring of 1899 in time for planting that season. It was obtained, along with other cereals, while making an exploration of the cold and semiarid regions of Russia and western Siberia in 1898–99 in search of cereals adapted to corresponding conditions in this country. At the same time two other oat varieties were obtained, one of which, the Tobolsk, is of much value, but the Swedish Select is proving to be by far the best of the three in nearly every respect. It originated in Sweden as a pedigree variety developed by selection many years ago and was afterwards grown in Finland and in St. Petersburg Province, Russia. Under the severe weather conditions of these localities it became well acclimated for a cold and dry climate.

CHARACTERISTICS.

The Swedish Select variety is a large-grained white oat, with a spreading top or panicle. (See Pl. I.) The distinguishing marks are a blunt, plump kernel, with, usually, dark, slightly twisted awns and a heavy weight per bushel. It is a very prolific variety, which quality, together with the size and weight of the kernel, is no doubt the result of previous selection. The usual weight per bushel is 34 to 36 pounds, while in Montana a weight of 44 to 46 pounds is not rare. In order, therefore, to appreciate its real superiority over other varieties in yield per acre, comparison must be made on the basis of bushels

by weight instead of measured bushels. It also grows to a considerable height and produces much straw, its chief fault being a tendency toward overproduction of straw when grown on rich or low land. The roots are large and vigorous, giving the plants hardiness in cold or dry seasons. This quality was probably developed during the period of acclimation in northern Russia. Plate II shows a sample of the Swedish Select oat in comparison with two other introduced oats, Sixty-Day and North Finnish Black.

RESULTS OF TRIALS IN THIS COUNTRY.

Only 20 bushels of seed of the Swedish Select oat were obtained in the original introduction.[a] One other importation of 160 bushels was made through Mr. E. A. Bessey in 1901.[b] However, a large percentage of the present production has descended from the 20 bushels received in 1899.

In another publication of this Department[c] the following statement by the writer is made at the close of a description of this oat:

> In this country it will be suitable for cultivation in all the extreme Northern States, from New York to Washington, and in southern Alaska.

With the exception that northern New England might have been included, no statement could be more completely and accurately confirmed by present results than this one has been after ten years of experience. The results of a long series of trials show that this variety is sharply limited in its adaptation to just the region mentioned and that it is not only much superior to other kinds previously grown in that region but is just as much inferior to other kinds in adaptation to other regions. It is just as worthless for Texas and Tennessee as it is superior for Wisconsin and Montana.

The whole series of trials of the Swedish Select oat in the United States and the accompanying results have been extremely interesting. No other introduced oat has been so thoroughly and widely tested.[d]

This oat was grown on the experimental plats of the Agricultural Academy at Moscow, Russia, and was considered by Professor Williams, of that institution, to be an excellent variety for the North.

---

[a] Inventory No. 4, Division of Botany, U. S. Dept. of Agriculture, 1899, p. 3 (S. P. I. No. 2788), and Inventory No. 7, same series, 1900, p. 13 (S. P. I. No. 2788).

[b] Bulletin 66, Bureau of Plant Industry, U. S. Dept. of Agriculture, p. 276 (S. P. I. No. 9422).

[c] See "Russian Cereals Adapted for Cultivation in the United States," Bulletin 23, Division of Botany, U. S. Dept. of Agriculture, 1900, p. 21.

[d] It may be of interest, however, to state that another variety, the Sixty-Day, also from Russia, stands second in the attention it is receiving and promises to become fully as popular as the Swedish Select, although it is adapted to conditions largely just the opposite of those required by the latter oat.

THREE VARIETIES OF OATS INTRODUCED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE: *A*, SIXTY-DAY; *B*, SWEDISH SELECT; *C*, NORTH FINNISH BLACK.

TRIALS BY EXPERIMENT STATIONS.

A large part of the seed of the first introduction was placed immediately with the agricultural experiment stations in the Northern States and planted in the spring of 1899. From this time forward the most extensive trials have been made at the experiment stations in Wisconsin, North Dakota, and Montana. A report of these trials will be given. In Wisconsin and North Dakota the experiments have for some time constituted a part of the regular series conducted in cooperation with this Bureau.

Wisconsin.

The results obtained by the Wisconsin Agricultural Experiment Station have been exceedingly interesting. Only 6 pounds of seed were sent to the station, and this quantity was sown on a tenth-acre plat. In the words of Prof. R. A. Moore, agronomist—[a]

> The results were so favorable that an effort was put forth to improve them by selection and careful grading of the seed for each season's crop. In all comparisons with selected varieties of oats the Swedish were equal to the best in point of yield and had several desirable characteristics superior to other varieties.

Concerning the good qualities of this variety, Professor Moore states as follows:[b]

> The Swedish Select oats (Wisconsin No. 4) seem especially adapted for high, well-drained land, and the best-known returns are from clay-loam soils. The great root development is one of the characteristics of the Swedish oats, which enables the plant to resist drought better than any other variety tested. The straw is coarse and is noted for its stiffness and power to withstand lodging. The Swedish oats lodged for the first time during the four years' test on the experimental farm the past season, this being due to the severe storm of July.

On the experiment station farm such good results were obtained in 1899 and 1900 that 7½ acres were sown in 1901, with the view of increasing the quantity of seed for distribution throughout the State. This crop made 306 bushels, a yield of 40.8 bushels per acre, in spite of the serious drought of that season. This drought, though it appears to have been particularly severe at Madison, where this good crop of Swedish Select oats was grown, was general throughout the State and, in fact, throughout the Northwest. The average yield of oats for the State was thereby reduced to less than 30 bushels per acre. There is shown, therefore, in this comparison a striking exhibition of the drought-resisting quality of the Swedish Select.

In the mean time there was organized the Wisconsin Agricultural Experiment Association, composed of people connected with the Wisconsin College of Agriculture, which association has become extremely effective in improving the crops of the State. Seed of

[a] Third Annual Report, Wisconsin Agricultural Experiment Association, p. 9.

[b] First Annual Report, Wisconsin Agricultural Experiment Association, p. 16.

the Swedish Select oat was sold to members of this association, and in 1902 forty-one members grew this oat in thirty-three different counties of the State. The average yield per acre from all these trials was 53 bushels, while the average yield of ordinary oats for the State was 40 bushels. No doubt a part of this difference in yield should be credited to the better methods of cultivation that would likely be practiced by these men, but it is probable that the larger percentage of increase was due to the variety employed. In 1903, 1904, and 1907 certain members of the association grew other varieties in comparison with the Swedish Select, with results here tabulated as follows:

1903.

Number of members reporting	100
Number of acres sown	538¾
Number of bushels harvested	23,705
Average number of bushels per acre of Swedish Select	44
Average number of bushels per acre of other varieties	37.5

1904.

Number of members reporting	30
Number of acres sown	352
Number of bushels harvested	18,300
Average number of bushels per acre of Swedish Select	45
Average number of bushels per acre of other varieties	40

1907.

Number of members reporting	96
Number sowing on fall-plowed land	64
Number sowing on spring-plowed land	32
Number sowing with a drill	44
Number sowing with a seeder	46
Number treating for prevention of smut	25
Number of cases where oats were smutted	17
Number of cases where oats rusted badly	61
Average number of bushels per acre of Swedish Select	27.9
Average number of bushels per acre of other varieties	24.3

Seed has been sold by members of the experiment association to other farmers of the State, until the Swedish Select oat has become very widely distributed. Professor Moore estimates that 150,000 bushels were grown in 1903, 4,000,000 bushels in 1904, and in 1905 8,000,000 bushels by at least 10,000 farmers. In 1906 about 12,000,000 bushels were produced, and in 1907 at least 20,000,000 bushels, though the season was very unfavorable. In 1908 no less than 30,000,000 bushels were harvested, or over two-fifths of the entire oat crop of the State. These estimates refer only to the crop descended from the original 6 pounds of seed sent to the experiment station. There is a considerable production in Wisconsin descended from other seed and referred to in another place. About three-fourths of the members of the Wisconsin Agricultural Experiment Association were growing the Swedish Select oat in 1908.

The results of a 10-year yield test of the Swedish Select oat in comparison with that of a number of other good varieties at the Wisconsin Agricultural Experiment Station are summarized below in bushels per acre, the average yield for the State being given also for further comparison:

TABLE I.—*Yield to the acre of the Swedish Select oat compared with that of other varieties grown at the Wisconsin Agricultural Experiment Station and throughout the State from 1899 to 1908, inclusive.*

Year.	Swedish Select.	Highest yield of any other variety.	Average of all other varieties.	Average yield of oats in Wisconsin.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*
1899	50.6	65.0	49.4	36.0
1900	64.5	79.2	49.4	32.0
1901	38.1	46.8	30.2	29.1
1902	69.2	61.3	46.1	39.9
1903	72.0	72.5	59.0	32.8
1904	62.0	64.0	50.3	35.0
1905	50.0	66.8	43.4	39.0
1906	39.0	78.1	32.6	37.4
1907	12.5	33.7	17.5	22.0
1908	50.0	63.6	45.0	31.1
Average	50.8	63.1	42.3	33.4

Table I shows that the yield per acre of the Swedish Select oat as an average for 10 years is 50.8 bushels and is 8.5 bushels greater than the average yield of all other varieties tested during this time. An average of the highest yield reached by any other variety during the period is 63.1 bushels. This statement must not be misunderstood. The highest yield was not made by the same variety each year. The Swedish Select made the greatest average yield for the 10-year period. With reference to the yield of the Swedish Select oat in 1907, Professor Moore comments as follows:

Our test plots were located in a hollow, and the heavy rains during the summer partially flooded some of the ground, and the oats were badly lodged and affected with rust to such an extent that the crop was almost a failure. A member of our experiment association, who lives near the university farm, has been carrying on tests with these (Swedish Select) oats for several years under our direction. I almost think it would be fair to use his figures in this report as he has been carrying on his work in accordance with my directions for several years. His report on 18 acres this year with the Swedish Select oats is 33 bushels to the acre.

The seven varieties yielding the highest per acre for the period 1899–1903 are as follows:

	Bushels.
Swedish Select	58.8
Big Four	56.3
Silver Mine	55.6
Early Gothland	54.8
Lincoln	53.6
Wisconsin Wonder	53.5
Siberian	53.0

The figures for the Swedish Select and the Siberian varieties are for the full 5-year period. The other varieties, except the Wisconsin Wonder, were sown first in 1900, and the average yields are therefore for 4 years only, while the Wisconsin Wonder was grown only in the 3 years from 1901 to 1903. The same varieties made the highest yields for the 7-year period from 1899 to 1905, but in the following order:

	Bushels.
Swedish Select	58.1
Wisconsin Wonder	56.1
Big Four	55.3
Siberian	54.9
Early Gothland	53.5
Lincoln	53.3
Silver Mine	50.9

The Swedish Select is the only one of the seven varieties that was grown every year of this period. The Siberian, Early Gothland, and Silver Mine were grown for 6 years, and the Wisconsin Wonder, Big Four, and Lincoln for 5 years. The average yield per acre of the Swedish Select oat for 7 years is 2 bushels greater than that of the Wisconsin Wonder, standing next highest, though from fifteen to thirty-five good varieties were compared during this time, while during 8 years it averaged 3.3 bushels per acre more than the Siberian, which yielded next highest for that period.

Such figures as the foregoing do not, however, give an accurate idea of the yields, as all varieties are not always grown the same years. By substituting Tobolsk for Lincoln we have seven kinds, some or all of which have been grown every year of certain periods. For example, the seven were grown each of the 6 years from 1901 to 1904, 1906, and 1907, with average yields per acre as follows:

	Bushels.
Swedish Select	59.5
Wisconsin Wonder	47.3
Siberian	44.1
Early Gothland	42.5
Big Four	41.6
Silver Mine	40.8
Tobolsk	36.1

Six of these seven varieties were each grown every year of the 7-year period from 1900 to 1904, 1906, and 1907, and another series of six was grown every year of the 7-year period from 1901 to 1904 and from 1906 to 1908, with yields as follows:

Period, 1900–1904, 1906, and 1907.

	Bushels.
Swedish Select	60.2
Big Four	46.3
Siberian	45.1
Silver Mine	45.0
Early Gothland	43.6
Tobolsk	38.7

Period, 1901–1904 and 1906–1908.

	Bushels.
Swedish Select	58.2
Wisconsin Wonder	46.0
Early Gothland	43.1
Big Four	42.4
Silver Mine	42.2
Tobolsk	36.8

Five of these seven varieties were grown every year of an 8-year period, 1900–1904 and 1906–1908, with the following average acre yields:

	Bushels.
Swedish Select	58.9
Big Four	46.7
Silver Mine	45.7
Early Gothland	44.0
Tobolsk	39.2

Three varieties were grown every year of the 9-year period from 1900 to 1908, with yields as follows:

	Bushels.
Swedish Select	57.9
Silver Mine	44.9
Early Gothland	43.3

The Swedish Select is the only variety grown during the entire 10-year period from 1899 to 1908, giving an average acre yield of 50.8 bushels, as already mentioned. (See Pl. III.)

This summary of the tests at the Wisconsin Agricultural Experiment Station, in which many good varieties were employed, indicates a complete victory for the Swedish Select oat. To give an average yield during 9 years of 13 bushels more than the Silver Mine, and during 8 years of 12.2 bushels more than the Big Four, which the Swedish Select has done, is an indication of exceptional merit, as these two oats are considered among the best in the North-Central States. The Wisconsin Wonder stands high in one of the 7-year periods and is apparently a good oat.

The Sixty-Day oat was grown each year of the last 4 years, 1905–1908, and during these years gave an average yield of 59.1 bushels, considerably larger than that of the Swedish Select for the same period. This period, however, includes particularly unfavorable years for the latter, compared with other sorts. During an 8-year period the Swedish Select oat gave an average yield almost equal to that of the Sixty-Day for the 4 years from 1905 to 1908.

North Dakota.

A valuable characteristic of the Swedish Select oat is its hardiness in seasons of drought and cold and its ability to produce well on high, poor land. On the other hand, under very favorable conditions for oat production it is likely to prove inferior to other good varieties.

This fact is well illustrated in the results obtained at the North Dakota Agricultural Experiment Station at Fargo. This experiment station is located in the Red River Valley, a region of low elevation, having a rich, black soil and a good average rainfall. In recent years the rainfall has been considerably above the average, finally resulting in 1905 in actual inundations of portions of the valley, including the site of the experiment station. Accordingly, no comparison of yields of oats can be given for 1905. The loss of seed by fire prevented the sowing of the Swedish Select variety in 1901. For the remaining years from 1899 to 1908 the yield per acre of the Swedish Select, compared with other varieties, is as follows:

TABLE II.— *Yield to the acre of the Swedish Select oat compared with that of other varieties grown at the North Dakota Agricultural Experiment Station and throughout the State from 1899 to 1908, except 1901 and 1905.*

Year.	Yield of Swedish Select.	Highest yield of any other variety.	Average yield of all other varieties.	Average yield of oats in North Dakota.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*
1899	75.4	81.1	70.7	30.0
1900	23.0	45.7	29.1	10.3
1902	30.8	72.2	40.7	38.4
1903	68.2	77.3	62.8	27.4
1904	54.6	75.4	57.8	37.4
1906	48.1	55.6	46.6	32.5
1907	58.7	78.0	58.1	24.5
1908	67.0	95.2	79.8	23.4
Average	53.2	72.6	55.7	28.0

It will be observed that here the Swedish Select compares unfavorably with other varieties, its yield per acre being less than the average for all others in the years 1900, 1902, 1904, and 1908, and its average for the 8 years less by 2½ bushels than the average for all other varieties for that period. It remains, however, pretty nearly an average variety in yield for that region, and is superior to many others in size and weight of kernel. As might be supposed, it has done much better in higher and drier portions of the State westward. Prof. J. H. Shepperd, collaborator in these investigations, writes as follows:

> The Swedish Select oat has not proven a very good variety under local conditions. It does far better on our lighter and drier soil.

At the branch experiment station at Edgeley, N. Dak., in 1903 and 1904 this variety gave good results, making a yield per acre considerably greater than the average of all other varieties. (See fig. 1.)

MONTANA.

At the Montana Agricultural Experiment Station, at Bozeman, the conditions for oat cultivation are even more favorable ordinarily than at Fargo, N. Dak. Here, also, in a 5-year trial the Swedish Select oat gave yields inferior to those of a number of other varieties. In

FIELD OF SWEDISH SELECT OATS ON THE EXPERIMENT STATION FARM AT MADISON, WIS., IN 1906.

(From a photograph furnished by Prof. R. A. Moore.)

addition to the low-lying rich soil and excellent climate the oat plats had the advantage of irrigation. Other trials by farmers in other parts of the State were made under conditions of "dry farming" without irrigation. Results are available only for the period from 1900 to 1905, inclusive, and through some oversight the Swedish Select variety was not sown at the experiment station in 1902. This happened, too, to be a year of enormous yields, one variety, the Wide Awake, yielding 172.5 bushels per acre. For the remaining years

FIG. 1.—Field of Swedish Select oats in shock, at Edgeley, N. Dak., in 1904.

in this period from 1900 to 1905 the yield of the Swedish Select, compared with five other varieties, was as follows:

TABLE III.—*Yield to the acre of the Swedish Select oat compared with that of five other varieties grown at the Montana Agricultural Experiment Station during 1900 and 1901 and from 1903 to 1905.*

Variety.	1900.	1901.	1903.	1904.	1905.	Average.	Weight per bushel.	Period of growth.
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bushels.*	*Pounds.*	*Days.*
Progress	93.2	92.4	127.5	137.4	112.5	112.6	41.6	118.0
White Danish	99.5	92.4	114.4	135.2	138.8	116.1	41.1	118.0
Wide Awake	79.6	94.3	120.0	141.7	115.6	110.2	41.9	117.0
Scotch	79.6	95.2	97.5	153.4	112.5	107.6	41.5	116.0
Swedish Select	93.2	100.2	99.4	133.4	108.8	107.0	44.1	111.5
Bland's White	95.6	87.7	113.4	113.1	112.5	104.5	40.6	122.0

The Swedish Select oat stands fifth in the list in yield. These varieties only were grown in 1905. For the years 1900, 1901, 1903, and 1904 the following other varieties made an average yield greater than that of the Swedish Select, while several fell below it:

	Bushels.
Mogheda	109.8
American White	109.2
American Beauty	107.9
Archangel	106.9

It will be noted in Table III that the Swedish Select oat stands much above the others in weight per bushel. It is also four days earlier than any other variety. Only one variety out of fifteen, the

Badger Queen (not grown in 1905), weighed more than the Swedish Select, the average weight of the former for four years being 44.5 pounds per bushel.

SOUTH DAKOTA.

Next to Wisconsin, more attention has been given to the Swedish Select oat at the South Dakota Agricultural Experiment Station, at Brookings,[a] than at any other point. Here this oat has been grown throughout the 10-year period from 1899 to 1908, but in 1902 no results were reported because of the damage by wind, and in 1903 all varieties were entirely destroyed by hail. Therefore, actual results are available for only 8 years out of the 10.

During the period mentioned, 1899–1908, many varieties of oats were grown, a number of them having just been introduced by the writer from Russia and other foreign countries. In the following table is given the yield per acre obtained with some of the best sorts, only two of which, the Swedish Select and the Tobolsk, were grown each of the eight years.

TABLE IV.— *Yield to the acre of the Swedish Select oat compared with that of other varieties grown at the South Dakota Agricultural Experiment Station from 1899 to 1901 and from 1904 to 1908.*

Variety.	1899.	1900.	1901.	1904.	1905.	1906.	1907.	1908.	Average.	Number of years grown.
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bushels.*	
Swedish Select	41.65	22.7	59.0	70.0	45.3	61.6	24.1	25.0	43.67	8
Tobolsk	35.50	24.3	57.0	55.6	40.6	47.5	5.0	21.8	35.91	8
Sixty-Day	.....	.....	65.0	69.6	80.0	61.6	24.4	59.2	59.96	6
Lincoln, No. 151	.....	.....	.....	50.7	24.3	42.2	14.1	17.6	29.78	5
White Schoenen, No. 153	.....	.....	.....	46.8	20.6	19.4	.....	8.4	23 8	4
Bavarian, No. 150	.....	.....	.....	46.8	30.2	32.7	.....	13.4	30.77	4
Banner, No. 160	.....	.....	.....	54.7	35.2	42.7	8.1	2.5	28.64	5
American Triumph, No. 162	.....	.....	.....	52.7	30.5	45.5	10.9	4.3	28.78	5
American Beauty, No. 163	.....	.....	.....	55.6	28.7	43.8	10.3	5.0	28.68	5
North Finnish Black	.....	.....	.....	65.0	35.7	40.8	5.0	20.6	33.42	5
Holstein Prolific, No. 158	.....	.....	.....	55.6	22.8	44.4	11.9	5.4	28.02	5
Wide Awake, No. 154	.....	.....	.....	51.7	24.1	35.0	11.9	12.5	27.04	5
Abyssinian, No. 155	.....	.....	.....	54.7	25.6	37.2	14.4	16.2	29.62	5
Columbus, No. 156	.....	.....	.....	58.6	31.9	42.8	17.8	15.0	33.22	5
Golden Beauty, No. 159	.....	.....	.....	56.6	27.5	42.4	13.8	6.2	29.3	5
Belyak, No. 10624	.....	.....	.....	28.0	37.5	42.8	9.1	26.8	28.84	5

It is seen that the Swedish Select variety yielded better than any other oat except the Sixty-Day, which gave a much better average for the years it was grown, 1901–1908. During these same years the Swedish Select average was 47.5 bushels, while 59.96 bushels was the

[a] All the experiments were cooperative between this Bureau and the state experiment station and were undertaken with Prof. E. C. Chilcott (now of this Bureau) in charge of the department of agronomy at the state station and were continued afterwards while his former assistant, Mr. J. S. Cole, was in charge of the same department. Early in 1908 Prof. C. Willis was elected to this position, and beginning with the season of 1909 all cooperative experiments with the Office of Grain Investigations have been concentrated at Highmore, S. Dak., with Mr. Manley Champlin, special agent of this Bureau, in immediate charge.

Sixty-Day average. The latter is already to a large extent replacing the former in eastern sections of the State. Until recently the Swedish Select has been by far the most popular oat and is still largely employed in the drier districts. It is an attractive oat, because of the size and weight of its kernel and its usual freedom from discoloration. The Tobolsk and the North Finnish Black, standing third and fourth in rank, respectively, are also northern varieties adapted to cool, dry seasons and high plains. (See Pl. II.)

Through the medium of the state experiment stations a considerable distribution of seed of the Swedish Select oat was made to farmers in South Dakota and North Dakota. Concerning this distribution in South Dakota, Mr. J. S. Cole wrote as follows: [a]

> It was distributed in this State by the state experiment station in 1901. In 1902 a more extensive distribution was made, and every year since several hundred bushels have been sold to farmers by the station. In the western part of the State it has made a good crop in years when the common varieties were a total failure, but in the eastern and southeastern portions of the State in years of excessive moisture it is likely to grow too rank and to be damaged by rust. It is no more subject to damage in this way, however, than are all common varieties of oats.

At the branch experiment station at Highmore, S. Dak., the Swedish Select oat was grown during the period from 1903 to 1909, inclusive.[b] Here the conditions are usually severe for oat growing, and this variety gave good results compared with others, as is shown in the following table:

TABLE V.—*Yield to the acre of the Swedish Select oat compared with that of other varieties grown at the branch experiment station at Highmore, S. Dak., from 1903 to 1909, inclusive.*

Variety.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	Average for 4 years (1906–1909).	Average for 5 years (1905–1909).	Average for 7 years (1903–1909).
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*
Swedish Select	38.1	54.4	55.0	65.0	30.8	32.9	36.6	41.3	44.1	44.7
Sixty-Day	24.1	41.3	64.1	*43.3	31.5	47.5	28.8	37.8	43.1	40.2
Kherson	.....	.....	.....	69.7	28.7	45.8	21.9	41.5	.....	.....
Red Algerian	.....	.....	60.3	49.1	21.8	32.8	23.4	31.8	37.5	.....
Belyak	.....	.....	52.5	55.6	26.5	21.3	22.8	31.6	35.7	.....
Golden Beauty	.....	.....	.....	60.3	26.5	27.5	17.2	32.9	.....	.....
American Beauty	.....	.....	.....	47.8	35.3	25.3	20.3	32.2	.....	.....
American Triumph	.....	.....	.....	49.4	31.5	26.3	20.3	31.9	.....	.....
Columbus	.....	.....	.....	52.5	25.0	28.1	16.3	30.5	.....	.....
Lincoln	.....	.....	.....	45.6	30.6	29.7	15.6	30.4	.....	.....
Danish	.....	.....	.....	46.3	26.8	30.3	15.0	29.6	.....	.....
Canadian	.....	.....	.....	52.2	23.4	30.3	12.5	29.6	.....	.....
Holstein Prolific	.....	.....	.....	48.8	26.2	22.5	17.8	28.8	.....	.....
Abyssinian	.....	.....	.....	50.9	25.3	25.0	12.8	28.5	.....	.....
Wide Awake	.....	.....	.....	42.5	24.6	28.9	10.6	26.7	.....	.....
White Tartar	.....	.....	.....	44.7	26.2	25.0	4.7	25.2	.....	.....

* This yield of the Sixty-Day oat is not comparable with any of the others for that year, as it was grown after sorghum, while all the others were grown under better conditions. This is proved by the fact that the Swedish Select was duplicated on the sorghum ground and made there only 42.8 bushels per acre. However, using this figure the 7-year average, 41.5 bushels, thus resulting for the Swedish Select is still somewhat larger than that for the Sixty-Day.

[a] Bulletin 96, South Dakota Agricultural Experiment Station, March, 1906, p. 54.

[b] The tabulations in this bulletin usually do not go further than the year 1908, but there are so few years' results at Highmore, S. Dak., that it seems necessary to include here the year 1909.

Taking an average of all trials in each case, the Swedish Select variety gave the best yield, though the Kherson yielded a trifle better in the 4-year average, 1906–1909. The yield of the Swedish Select at Highmore in 1903 was not quite as good as the average oat yield throughout the State (38.6 bushels), because of severe drought in that district. Highmore is considerably west of the one hundredth meridian, where it is ordinarily very dry for oats. On the other hand, in 1905 (a wet season) and 1908 the Sixty-Day exceeded the Swedish Select in yields. With reference to the crop of 1903, Prof. E. C. Chilcott wrote as follows:

> It is worthy of note that at the driest time the Swedish Select oat appeared to be the most drought-resistant grain on the farm, with the Minnesota No. 6 Manchuria barley a close second. This appearance was borne out by the yields at harvest time.

Washington.

The Swedish Select oat was grown on the Washington Agricultural Experiment Station farm at Pullman during three seasons. In 1903 it made 55 bushels per acre. In 1904 it yielded 86 bushels, in comparison with 82.5 bushels as the highest for any other variety and an average of 61.3 bushels for all other kinds. In 1905 it yielded 53 bushels, the same as the average for all others, while it was exceeded by one variety, the Sixty-Day, which yielded 84 bushels. The average yields for the State during these years were 47.9 bushels in 1903; 44.9 bushels in 1904; and 50 bushels in 1905. The results reported by farmers from other portions of the State where the climate is drier were much more to the credit of the Swedish Select.

Colorado.

In 1900 the Swedish Select oat yielded 18 bushels per acre at the branch experiment station at Cheyenne Wells, Colo., where, at that time, it was hardly expected that any cereal crop would produce anything. The average yield of this variety at the Colorado Agricultural Experiment Station, at Fort Collins, for the years from 1905 to 1907 was 88.4 bushels, the average of all other varieties being 86.8 bushels for the same period.

Iowa.

As already mentioned, the Swedish Select oat is adapted particularly to the Northern States. Iowa may be considered as a transition area between the northern and central districts (see fig. 2). As might be expected, therefore, this oat does not compare quite so well with other varieties in that State as farther north, but nevertheless ranks rather high in acre yields. In the several years' experiments conducted at Ames by the Iowa Agricultural Experiment Station, some results of which were published by Prof. M. L. Bowman in a

"Seed Oat Special," it was found to stand third in yield among sixteen good varieties as an average of four years' trials, 1905–1908.

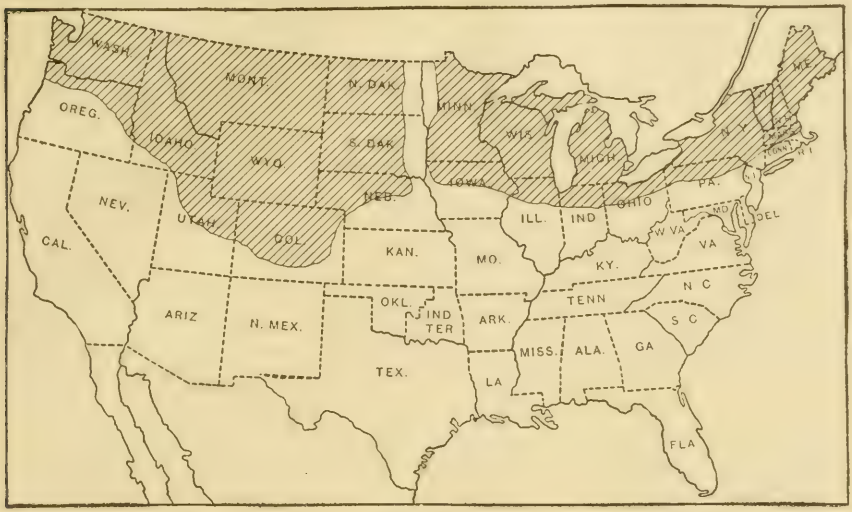


FIG. 2.—Map of the United States, the shaded portion showing the region to which the Swedish Select oat is adapted.

The following is a tabular statement of the average date of ripening, acre yield, and weight per bushel of the sixteen varieties:

TABLE VI.—*Average date of ripening, acre yield, and weight per bushel of the Swedish Select oat compared with those of fifteen other varieties grown at the Iowa Agricultural Experiment Station from 1905 to 1908, inclusive.*

Variety.	Average date of ripening.	Average yield per acre.	Average weight per bushel.
		Bushels.	*Pounds.*
Kherson	July 15	60.2	30.00
Silver Mine	July 23	56.0	27.00
Swedish Select	July 24	50.5	29.50
Sixty-Day	July 15	48.7	29.75
Minnesota, No. 25	July 24	47.6	25.25
National	July 25	47.4	28.00
White Alaska	July 14	47.0	30.75
Irish Victor	July 24	46.9	25.50
White Russian	July 30	46.3	26.50
Minnesota, No. 6	July 24	45.7	27.00
Joanette	July 26	45.3	27.75
Siberian	July 25	44.5	25.75
Early Champion	July 14	44.4	29.50
Tartar King	July 22	40.1	27.25
White Tartar	July 30	37.4	28.75
Danish	July 25	35.2	24.00

Table VI shows that only two varieties, the Kherson and the Silver Mine, exceed the Swedish Select in acre yields, and only three, the White Alaska, the Kherson, and the Sixty-Day, exceed it in weight per bushel. It may be considered, therefore, as one of the best varieties for Iowa, but not absolutely the best.

ALASKA.

Under the direction of Prof. C. C. Georgeson, Special Agent in charge of the Alaska Agricultural Experiment Stations, the Swedish Select oat has been tested at one or more points in Alaska in competition with other varieties during the entire period from 1900 to 1908, except the season of 1901. In nearly all cases it either partially or fully matured, though in three instances it appears to have failed completely—at Kenai in 1903, at Sitka in 1904, and at Rampart in 1905. In two of these instances all other varieties also failed.

The weather conditions at Copper Center, though south of Rampart, are more severe than at the latter place, and cereals have usually done better at Rampart. Nevertheless, the Swedish Select oat at Copper Center was cut for seed in 1904 and gave a "good average crop," the plants being "well filled." The plants matured also in 1905 and partially matured in 1906 and 1907. The North Finnish Black, another variety introduced by this Department, is the only one that has been constantly more successful than the Swedish Select.

The specimen of the Swedish Select oat shown in Plate I was grown at Sitka in 1903.

MISCELLANEOUS.

In some other States entirely outside of the northern oat district, such as Indiana and Ohio, the Swedish Select stands still farther removed from the top in yielding capacity in comparison with other kinds, according to results at the experiment stations, but even in those States gives results usually considerably better than the average.

TRIALS BY FARMERS.

While the tests of any crops made by farmers are not likely to be so accurate as a rule as those made at experiment stations, nevertheless more satisfactory information may often be obtained from such tests because of their greater number and the fact that they represent such a variety of conditions of soil and climate. The system of securing, filing, and summarizing reports devised in the Office of Grain Investigations and used in cooperation with the Office of Seed and Plant Introduction and Distribution has made it possible to obtain a great amount of interesting information concerning this new oat variety.

It may be of value to the reader to give extracts from some of the most important reports on the Swedish Select oat received from farmers.

WASHINGTON.

Mr. Gilbert Engbritson, of Edison, Skagit County, Wash., 80 miles north of Seattle, wrote as follows on September 15, 1904:

I beg to make a second report to your Department on the results of the second crop of the 2 pecks of No. 9422 Swedish Select oats mailed to my address February 16, 1903.

The 2 pecks planted in 1903 produced the seed for planting 7 acres in 1904, which were thrashed on the 12th instant, yielding 1,050 bushels, averaging 150 bushels per acre—a remarkable yield of bright, heavy oats of excellent quality which has attracted the attention of the entire community.

In 1906 Mr. Engbritson harvested 7,987 bushels, yielding 126 bushels per acre.

Mr. Anton Lehnhoff, of Mount Vernon, Wash., bought seed from Mr. Engbritson and in 1905 obtained a crop of 9,600 bushels, at the rate of 90 bushels per acre, while other varieties on the same farm made 75 bushels.

IDAHO.

Mr. F. W. Boehme, of Geneva, Idaho, has been a very successful cooperator in trials of different cereals received from this Department. His farm lies along the Thomas Fork of the Great Bear River, in extreme southwestern Idaho, at an elevation of 8,000 feet. On December 26, 1905, he wrote the following statement:

The Swedish Select oats yielded 1,988 pounds from 61¼ pounds of seed (corresponding to at least 65 bushels per acre), all nice, white, and heavy grain.

Clark and Haughton, of St. Anthony, Idaho, thrashed 8,000 bushels of the Swedish Select in 1905, yielding 65 bushels per acre. Other oats on similar soil and under similar treatment yielded 45 bushels per acre and weighed 5 pounds less per measured bushel.

Mr. J. D. Louis grew the Swedish Select oat 2 years at St. Anthony, Idaho. In 1906 a part of the crop was irrigated and a part not irrigated. A yield of 43½ bushels per acre was obtained on the irrigated land, compared with 35 to 40 bushels produced by other varieties. Another unirrigated field of 9 acres of the Swedish Select yielded at the rate of 70 bushels per acre, testing 40 pounds to the measured bushel.

In 1903 the average yield of the Swedish Select oat grown by several farmers at Blackfoot, Idaho, was 60 bushels per acre, as reported by Prof. H. T. French, of the Idaho Agricultural Experiment Station.

COLORADO.

Mr. C. H. Morgan, of Norwood, Colo., wrote as follows on December 27, 1905:

A very fine early oat and of good weight, 45 pounds to the measured bushel. The 2 bushels you sent me weighed only 36 pounds to the bushel; therefore, I gained 9 pounds per bushel the first year.

Mr. Morgan obtained 60 bushels per acre, while other oats made 30 bushels. In 1906 he harvested 32 bushels on one-fourth acre which weighed 45 pounds per bushel, while other varieties yielded 40 bushels per acre.

Mr. T. A. Wright grew this oat two years at Greenwood, Colo. In 1906 he obtained one bushel of oats from a seeding of 6½ quarts, and in 1907 obtained 15 bushels from one-half acre, weighing 35 pounds to the bushel. He treated his oats thoroughly for smut prevention both seasons.

Mrs. S. B. Walker, of Sedalia, Colo., grew the Swedish Select oat two years, 1906 and 1907, beginning with a very small quantity of seed. In 1907 the total number of bushels thrashed was 270, and the yield per acre 45 bushels. The highest yield made by any other variety was 30 bushels—the Colorado White. Mrs. Walker writes as follows:

There is no irrigation whatever on the place, and I am endeavoring to bring about strictly dry-farming cultivation, most of the so-called dry farming in the vicinity being simply the raising of crops without water without any regard to previous cultivation and preparation of land, and in almost every instance no regard is paid to the dry mulch.

At Lansing, in eastern Colorado, Mr. A. S. Kester grew the Swedish Select oat in 1903, obtaining a very small yield per acre, but explained it as follows:

This was the only oat thrashed in this vicinity. We had no rain all summer. The season is considered the driest for the past 17 years with the exception of 1894.

Of the crop of 1904 Mr. Kester writes the following:

Bushels thrashed, 68; yield per acre, 14 bushels. The oats did not come up till the first week in May. It was very dry here in early spring and after the middle of June.

Mr. J. A. Riedesel, of Idalia, Colo., began growing the Swedish Select variety in 1903 and finally, after two partial failures, obtained 300 bushels in 1905, that is, 30 bushels per acre, other varieties yielding 25 bushels.

MONTANA.

Mr. C. H. Austin, of Cascade, Mont., obtained 62 bushels per acre in 1902, when other kinds of oats yielded from 30 to 50 bushels. He writes as follows:

These oats had no irrigation, nor were they on extremely low land. We treated them for smut with formalin and had no trace of smut.

Mr. W. W. Cook, of Chinook, Mont., reports as follows for 1903:

Bushels thrashed, 800; yield per acre, 50 bushels, weighing 48 pounds per bushel. These are the finest oats I ever saw. I sent a sample to Bozeman the other day that weighed over 50 pounds per measured bushel.

At the same place, the same season, Mr. Rudolph Hermes thrashed 900 bushels, yielding 64 bushels per acre.

Mr. T. L. Black, of Whitehall, Mont., obtained 80 bushels per acre in 1904, weighing from 42 to 45 pounds per bushel. His remarks concerning the variety are as follows:

This oat has proved to be extra early for me, and I consider it of great value in localities where water runs short for a second irrigation. The water was applied June 20. I also find that 1¼ bushels of seed per acre give better results when water is only available for one irrigation. Should be sown from April 1 to 10 when the above-mentioned conditions prevail.

Mr. J. J. Patterson, of Truly, Mont., obtained 90 bushels per acre in 1904 and reports a weight of 52 pounds per measured bushel.

At Bozeman, Mont., Mr. Jacob Carolus obtained 1,600 bushels of the Swedish Select oat on high land without irrigation, the yield being 40 bushels per acre.

MICHIGAN.

Mr. Marvin Babbitt, of Merson, Mich., reports as follows concerning his crop of 1903:

Yield per acre, 48 bushels; quality of grain, excellent; average yield of other kinds in the same locality, about 30 bushels. The Swedish Select is decidedly the best grown in this locality. It is very plump and seems to possess all the properties an oat should have.

Mr. B. F. Beckwith, of St. Clair, Mich., obtained 80 bushels per acre in 1905, when other oats in the locality yielded only 30 bushels. He writes as follows:

As I sowed the sample in 1904 I think it was rather a remarkable yield, considering the average yield of oats in this vicinity. If, when it becomes acclimated, it does half as well it will be remarkable.

In 1906 the yield per acre was 40 bushels, while other varieties on the same farm made 20 bushels. In 1908 occurred the greatest drought for many years. Even that season the Swedish Select yielded 40 bushels per acre.

Mr. James S. Bailey, of East Paris, Mich., at the end of four years' trial writes the following:

I think these are the best oats that I have raised, and I shall sow mostly the Swedish Select this next year.

In 1906 Mr. Bailey's crop was 193 bushels, a yield at the rate of 37 bushels per acre.

Mr. R. D. Morrison, of Merle Beach, Mich., grew the Swedish Select oat during the years from 1906 to 1909, getting an average acre yield of 32.6 bushels. He writes concerning the 1907 crop as follows:

I raised these oats in the same field as I did some Big Four oats and sowed them (the former) 2 weeks later, but they were ripe about the same time.

In 1908 the yield per acre was 35 bushels, while an adjoining field of another variety made 20 bushels per acre.

SOUTH DAKOTA.

Mr. H. C. Warner, of Forestburg, S. Dak., found the Swedish Select to be the best variety out of fifty-four under trial on his farm. In 1905 it yielded 75 bushels per acre, while other varieties made 50 bushels.

This oat was grown by Mr. G. A. Grant at Sherman, S. Dak., during 1906, 1907, and 1908. In the second year he obtained a crop of 913 bushels, averaging 40 bushels per acre. In 1908 the acre yield was the same and the total production 2,453 bushels. The only other variety grown on the same farm was the Sixty-Day, also introduced by this Department, which yielded 40 bushels per acre.

Mr. J. E. Behnke, of Beresford, S. Dak., grew the Swedish Select oat 7 years, 1903 to 1909, but no report is at hand of his 1906 crop. For the other 6 years his average yield per acre was 40.5 bushels, the separate yields being for 1903, 30 bushels; 1904, 55 bushels; 1905, 48 bushels; 1907, 50 bushels; 1908, 25 bushels; and 1909, 35 bushels. Yields of other varieties for certain years were as follows: 1903, 28 bushels; 1904, 41 bushels; 1905, 35 bushels; and 1908, 20 bushels.

Prof. J. H. Shepard, of Brookings, S. Dak., in addition to his official experience with introduced grains obtained through this Department, has taken much interest in a private way in trials on his own land of some of the best varieties. He states his experience with the Swedish Select as follows:

I sowed some on corn ground, some on manured land, and some on very rich ground. My findings are as follows: Remember the season (1905) was excessively wet. After barley and after oats I got a good stand; the oats did not go down and the berries were plump and heavy. The same is true after wheat.

On rich ground the oats lodged some in patches, but they all filled. On heavily manured land they went down in patches and they filled well, except where the lodged places occurred. On corn ground they lodged more, but not enough to prevent filling in the lodged places. On no kind of ground did they all go down, but in patches only. I believe that had the season been dry I would have had no lodged oats on any of these places and that the quality of the oats would have been all that could be desired. Naturally enough, the higher the ground the better the oats were during the past wet season. During dry seasons they might be sown on low land.

The record of yields this year (1906) was somewhat lower than last, owing to my experimenting under different conditions and also to the fact that a slight hailstorm ruined many berries when they were just coming into milk. My yield this year was 65 bushels per acre, last year 75 bushels, while under the best conditions on our experimental grounds the yield rose to 84 bushels per acre. But the most remarkable thing to my mind is that on my old land, which had been systematically robbed by 25 years of wheating, the best yield of oats I ever could get was 40 bushels of White Russian oats, and I never equaled that figure with any other kind, and I tried all I could get. The first year the Swedish Select jumped immediately up to 75 bushels, while the station has shown that this is by no means the limit. I sowed but 2 bushels and 1 peck per acre, as they are heavy stoolers, but believe that heavier seeding will increase the yield.

Moreover, the analyses of these oats, as made in my laboratories, show them to be exceptionally rich in protein. It is for these reasons that we consider them to be the best all-around oats for the Dakotas. They mature in about 108 days.

NEW YORK.

An interesting 6-year trial of the Swedish Select oat was made by Mr. S. J. Smith at Manchester, N. Y., beginning in 1903. His yields per acre were 84 bushels in 1903, 80½ bushels in 1904, 70 bushels in 1905, 75 bushels in 1907, and 60 bushels in 1908, or an average for these five years of 73.9 bushels. No report is received for the year 1906. The average yield of other varieties on the same and adjoining farms for the years from 1903 to 1905 was 60 bushels, and the average yield for the State of New York for the period from 1903 to 1908 was 32.6 bushels. Mr. Smith comments on his results as follows:

(1903.) A month of very hot, dry weather retarded a good start. One marked feature of the oat is its uniform berry.

(1904.) Our men thought more seed sown would have increased the crop to 90 bushels per acre (2 bushels per acre were sown). Potatoes were grown on the land the previous year. The soil was fairly fertile.

(1905.) The oats were grown on land that had not been clovered or fertilized for 10 years, and wet weather made a lumpy seed bed. On another farm this oat outyielded two other kinds 20 bushels per acre.

(1907.) Have discontinued growing the Sixty-Day oat. It is too light and the color is not satisfactory. The Swedish Select forwarded to us by you in 1903 is an ideal oat in every way. Can not grow enough to supply our seed trade.

(1908.) It has produced fine crops and the very best farmers have continued growing this variety. It is well adapted to clay soil. Last year our sales were about 4,000 bushels, and we could have sold many carloads at good prices if we had had the supply.

WISCONSIN.

As already mentioned, the most extensive series of tests of the Swedish Select oat by farmers was made in Wisconsin. These tests were rendered all the more thorough and accurate through the important part taken by members of the Wisconsin Agricultural Experiment Association. There are now in this office reports on this oat for both 1904 and 1905 from more than two hundred cooperators in Wisconsin. A number of these have sent reports for other years also. Very brief extracts are here reproduced from some of the most instructive of these reports.

Mr. A. D. Larson, of Waupaca, Wis.:

(1904.) The Swedish Select proves to be very well adapted to our soil and climate. It is by far the best yielder and of good quality. Yield per acre, 57 bushels. American Banner, 40 bushels.

(1905.) The soil on which I sowed the oats has been cropped continuously for 12 years without any fertilizer or clover seeding, yet the Swedish Select did very well. Yield per acre, 28 bushels. Average yield of other varieties, 20 bushels.

Mr. Joseph Reich, of East Gibson, Wis.:

(1904.) The oats ripened earlier than other oats of this vicinity, which had some smut and were more affected by the rust in general. Yield per acre, 86 bushels. Quality of grain, extra good. Average yield per acre of other kinds in the same locality, 50 to 60 bushels.

(1905.) I must say that this oat has a tendency to lodge in our locality. I would have thrashed at least 75 bushels if none had lodged, but I had to cut about half of it for hay. It ripens a week or 10 days earlier than our other varieties. Yield per acre, 55 bushels. Quality of grain, extra good. Average yield of other kinds in same locality, 35 to 40 bushels.

Mr. H. W. Kent, of Rusk, Wis.:

(1904.) The oats were cut a little green because of the rust and lodging. This variety does better than other varieties grown here. Yield per acre, 45 bushels. Quality of grain, average. Average yield per acre of other kinds in same locality, 40 bushels.

(1905.) This oat does better on light soil than on heavy. Yield per acre, 40 bushels. Quality of grain, good. Average yield of other kinds in the same locality, 30 bushels.

Mr. J. W. Stevenson, of Rice Lake, Wis.:

(1904.) I consider it a very good variety for this locality, being a good yielder and standing up well. Yield per acre, 50 bushels. Average yield of other kinds, 45 bushels.

(1905.) The Swedish Select for the last 3 years has yielded about 10 bushels more per acre than other varieties I have grown, and I think it is superior for feeding purposes. Yield of other varieties in same locality, 25 bushels.

Mr. A. C. Hagastad, of Etrick, Wis.:

(1904.) The ground was a mixed clover and timothy sod, and one of the lowest and worst fields we have for lodging. When the crop was 4 to 6 inches high we had about one week of cold, rainy weather, which set it back for a long time. It ripened several days ahead of our Siberian oat. It is a heavy yielder, the kernels are large and plump. Will sow all Swedish Select next year. Yield per acre, 70 bushels. Quality of grain, No. 1. Average yield of other kinds in same locality, 60 bushels.

(1905.) The straw is heavy and stiff, so will not lodge easily on rich soil. On lighter soil the straw is not so large but heads out good. Yield per acre, 66 bushels. Quality of grain, No. 1. Average yield of other kinds, 50 to 60 bushels.

Mr. Clarence Jordalen, of Stoughton, Wis.:

(1904.) Am very well pleased with the Swedish Select oat. I like it because it is a greater yielder than the other oats I have raised. It has a very stiff straw and will not lodge very quickly. Yield per acre, 60 bushels. Quality of grain, fairly good. Average yield of other kinds in same locality, 35 bushels.

(1905.) The variety seems to be adapted to this part of the country, for all who try it meet with success and grow no other kinds. Yield per acre, 62 bushels. Quality of grain, exceedingly good; plump and heavy. Average yield of other varieties in same locality, 30 bushels.

Mr. John E. Charley, of Ellsworth, Wis.:

(1904.) I am sorry to say that this oat is not liked here. I had it two years, but did not sell one bit of it for seed. The straw is too coarse and the hull is too thick. We have had the Lincoln and Silver Mine.

Mr. P. J. Bonzelet, of Eden, Wis.:

(1905.) This is the best oat, all things considered, that I have ever seen. Yield per acre, 60 bushels. Quality of grain, good. Average yield of other varieties, 35 to 40 bushels.

Mr. Edward Martin, jr., of De Pere, Wis.:

(1904.) This oat is of the finest quality I have ever seen. It will weigh about 40 pounds to the bushel. When I seeded last spring it averaged 108 pounds to the sack.

Mr. F. H. Williams, of Whitewater, Wis.:

(1905.) I am not at all pleased with the Swedish Select oat. Have tried it 2 years with about the same result. It does not yield good, crinkles down as soon as it begins to ripen, and has a very thick hull. One of my neighbors had 20 acres on good prairie soil that only yielded about 30 bushels per acre. Another got a yield of 23 bushels per acre. Yield per acre, 25 bushels. Quality of grain, good; very thick hull. Yield per acre of American Banner, same locality, 40 bushels.

Mr. J. W. Raven, of Bloomer, Wis.:

(1904.) Those that see the oats want seed. It is the best we have ever raised. A common grain sack holds 105 to 120 pounds. Will have seed grown from 100 acres to sell next year. Yield per acre, 40 bushels. Quality of grain, No. 1. Average yield of other varieties, 35 bushels.

Mr. John Patterson, of Cumberland, Wis.:

(1904.) I have grown this oat for 2 years and will say that while the yield is very good the quality is extra good and it ripens from 10 days to 2 weeks before any other variety and about 4 weeks before the side oats, which is the latest kind we have here. All the Swedish Select I grew last year I sold for seed, and what I have grown this year will be sold for seed. Yield per acre, 68 bushels. Average yield of other varieties on same farm, 55 bushels.

Mr. H. S. Pomroy, of Edgerton, Wis.:

(1904.) I did not keep a record of this variety, but found it not nearly as good as common white oats grown next to it under the same conditions. I shall not try it next season.

Mr. C. A. Peterson, of Cambridge, Wis.:

(1904.) The Swedish Select is superior to other varieties in even stand, earliness, heavy kernel, and trueness to type. Yield per acre, 58 bushels. Quality good. Average yield of other varieties, 26 to 30 bushels.

Mr. H. R. Moldenhauer, of Lebanon, Wis.:

(1904.) The Swedish Select is the best oat ever raised in this country. All other varieties had very much rust, this oat not enough to mention. The berry is plump, and the yield is more than double that of other crops. Yield per acre, 75 bushels. Quality very good. Average yield of other varieties, 30 bushels, and poor at that.

Mr. A. J. Moe, of Midway, Wis.:

(1904.) The variety is a fair yielder, stands up well, weighs heavy, and ripens about 2 weeks earlier than other kinds. Yield per acre, 40 bushels. Quality, fine and plump. Average yield of other kinds, 25 to 30 bushels.

Mr. Reuben Holmgreen, of Black River Falls, Wis.:

(1904.) My Swedish Select was the best of three kinds. Yield per acre, 70 bushels. Quality of grain, No. 1. Average yield of other varieties in same locality, 40 bushels.

Mr. W. S. Hood, jr., of Franksville, Wis.:

(1904.) People who saw the Swedish Select claim it was as nice an oat as they had ever seen and wished me to save seed for them. The kernel has a large meat and thin shuck. Yield per acre, 50 bushels. Quality of grain good. Yield per acre of Silver Mine oat, 40 bushels.

Mr. H. D. Griswold, of West Salem, Wis.:

(1904.) Other oats adjoining the Swedish Select on the same farm yielded 48 bushels per acre, while the latter yielded 61 bushels. Many fields of other varieties yielded only 30 bushels.

Mr. G. R. Downer, of Appleton, Wis.:

(1904.) This is the third year I have grown this oat, and I like it better than any I have ever tried. Yield per acre, 63 bushels. Quality good. Average yield of other varieties, 50 bushels.

Mr. John Dougan, of Beaver Dam, Wis.:

(1904.) The only fault I can find with this variety is that the hulls are rather thick and tough. Yield per acre, 50 bushels. Average yield of other varieties, about 40 bushels.

Mr. C. R. Blodgett, of Marshfield, Wis.:

(1904.) The best oat I have ever used in this locality, and I try to get the best. Yield per acre, 96 bushels. Quality good. Average yield of other varieties, 65 bushels.

Mr. J. W. Kaiser, of Foxlake, Wis.:

(1904.) I was very much pleased with this variety. I had 15 acres this year and harvested 700 bushels of the best oats in this part of the country. Other varieties averaged from 15 to 35 bushels per acre.

Some conflict may be noted in these reports in respect to the lodging of the Swedish Select oat. This may be because of local differences in soil conditions or "lay of the land," or more often, perhaps, because of different previous experiences with other varieties. This oat is known to lodge badly on low rich ground. At the same time, some other varieties may lodge worse. There is also a difference in opinion as to the thickness of the hull. This variety is probably not far from the average in this respect, so the hull may appear thick or thin to the grower, depending on the varieties he has formerly grown.

MISCELLANEOUS.

Mr. J. M. Maher, of Fremont, Nebr., writes as follows concerning his crop of 1905:

It was drilled in on April 25 on cornstalk ground that was disked over twice and not plowed, and was harvested July 20, and was stacked and thrashed October 18. It yielded 680 bushels on 10 acres, or 68 bushels per acre. It was well matured when I cut it, but it never broke down like the other kinds of oats I had alongside of it.

At Odebolt, Iowa, in 1904, the yields of ordinary oats were 40 to 45 bushels per acre, while the Swedish Select yielded from 50 to 60 bushels. Mr. J. A. Cranston, of that place, writes as follows:

These oats ripened about 5 days earlier than common oats.

L. and H. Goeppinger grew the Swedish Select variety for 3 years at Boone, Iowa, and in 1906 harvested 789 bushels, making an average yield of 43 bushels per acre, compared with 36 bushels produced by other oats. This is especially good, inasmuch as in recent years there have been wet seasons in that region which are particularly unfavorable to this variety.

Mr. A. W. Edson, of Austin, Minn., writes: "In this vicinity oats had to be planted in soil too wet." Yet, in his second year's trial of the Swedish Select (1906) it yielded 52 bushels per acre, compared with 40 bushels produced by other varieties. In 1907 the yield was 23 bushels per acre, other varieties averaging 18 bushels.

At North Water Gap, Pa., Mr. Luther Michael obtained a yield of 129 bushels per acre with the Swedish Select in 1904. In his report he makes the following statement:

Quality of grain, first class. Average yield per acre of other oats in the same locality, 40 bushels. The Swedish Select made a very rapid growth from the start and ripened 10 days earlier than any other variety in this section sowed at the same time. It is the best oat I ever grew.

Mr. M. B. Smith grew the oat at Belfast, Me., in 1903, and reports as follows:

Sown broadcast and harrowed in (would have done better drilled). Yield per acre, 65 to 70 bushels. Quality of grain, best I ever saw. Yield per acre of other kinds in same locality, 45 to 50 bushels. It was said by farmers who saw it that it was stouter and of better quality than any other grain they had ever seen raised in that country.

INTERESTING INDIVIDUAL TRIAL.

The most interesting case of success with the Swedish Select oat is that of the trial by Mr. David Jones, of Brandon, Wis. In the early spring of 1899 his son, Prof. L. R. Jones, of the University of Vermont, during a brief visit to the United States Department of Agriculture, obtained 36 kernels of this oat from an exhibition sample and sent them to Mr. David Jones. These were planted that same spring, and we have the following account from Prof. L. R. Jones of the behavior of the variety from that time forward:

Each seed was planted by itself, 6 inches apart. Thirty-three of the seeds grew, making a strong stand and yielding 1¾ pounds of grain. The next year, 1900, all of the 1¾ pounds was sown in drills, but no further attention was given it. Unfortunately, the grain was invaded and trampled down in midsummer, and so did not have a chance to develop a full crop. The yield was approximately 1 bushel. The third year, 1901, this bushel was sown broadcast on one-half acre and no special care given to it. The yield was 40 bushels of grain by measure, weighing 40 pounds per measured bushel, producing, therefore, 50 bushels by weight at 32 pounds per bushel.

In 1902 about 5 bushels of this seed were given to each of three other persons. None of their crop was saved as seed and no record is available of their yields. Mr. Jones sowed about 35 bushels on 12 acres. This yielded 900 measured bushels, weighing 40 pounds per bushel, which by weight would amount to 1,125 bushels. The yield was, therefore, 93 bushels per acre by weight. All of this crop was saved for seed.

In the fifth year, 1903, about 750 bushels of Mr. David Jones's crop were used by him or sold in his immediate neighborhood for seed. The only exact available record for the season is that Mr. F. E. Jones sowed 20 bushels on 10 acres and obtained a crop of 780 bushels by measure, weighing 40 pounds per measured bushel, making, therefore, a yield by weight of 975 bushels, or at the rate of 97.5 bushels per acre. It would be a safe estimate to say that 20,000 bushels were produced from this seed in 1903.

Mr. David Jones has taken much interest in work of this kind, which has not only been of much public benefit, but has always resulted very profitably to himself because of his careful selection of seed and the manner in which the crop has been handled. He has done similar thorough work with other varieties of oats, one of which, the Sixty-Day, was also introduced by this Department.

RECENT REPORTS.

Many of the preceding reports were written several years ago. The following reports are more recent and give a good idea of present conditions in Wisconsin with respect to this oat.

Mr. H. F. Kramer, of Bloomer, Chippewa County, Wis.:

It gives me pleasure to testify to the merits of Swedish Select oats, which I have grown for the past 6 years, for they have surpassed any of the other varieties tried in this locality in appearance, weight, large, plump kernels, early maturity, and a strong straw. While attending the short course in agriculture during the winter of 1902, I saw these oats for the first time. They appeared to be so much better than any others that I determined to secure some for seed, and was one of the first to apply when Professor Moore offered them to the experiment association for trial. The plat of ground on which they were sown was a good fertile soil, and the growing oats had a thrifty and healthy appearance all summer. When ready to harvest the oats averaged about 5 feet in height. The 80 pounds of seed which I had secured yielded 56 measured bushels, or 70 by weight. The season of 1903 was an unfavorable one to the growth of oats, but they led all others that I noticed. Even this last summer of 1907, the poorest in years, the Swedish oats are ahead at least 5 bushels per acre, and in quality also. One more feature, they are practically free from smut and very easily kept so. I have tried both broadcast seeder and the drill with 2½ bushels to 3½ bushels per acre, but find that 3 bushels sown with a drill produces the best results. I have had a ready sale for all that I have grown, in fact, never had enough to fill all of the orders I receive for seed. After shipping seed to various parts of the country, both by carload and in small lots, I have yet to hear the first complaint. To sum it all up, they do well and take wherever tried.

Mr. Fred G. Stroup, of Fond du Lac, Fond du Lac County, Wis.:

The land on which the oats were sown was black prairie soil which sloped to the west with good natural drainage. The land had had corn on it the year before. From the 4 acres we thrashed 180 bushels, machine measure, or 45 bushels per acre. The other oats that we raised that year in the same field, following the same crop, yielded 52 bushels, machine measure, but were sown 2 bushels per acre, while the Swedish

Select were sown 1 bushel per acre. We consider that the Swedish Select oats did considerably the best and have grown them exclusively during the past 3 years. We have had them yield as high as 75 bushels per acre by weight. We have sold this variety quite extensively for seed to farmers living in our neighborhood, and there is not a single case where it did not do better than the other varieties. The neighboring farmers have been loud in their praise of the Swedish Select oats.

Mr. H. E. Rosenow, of Oconomowoc, Waukesha County, Wis.:

We have been growing the Swedish Select oats for the past 4 years with satisfactory results as compared with other varieties, although we have at no time had an extra heavy crop. Comparing the yield with a variety of yellow oat grown for several years past, we have found the Swedish to yield a few bushels more per acre when grown in the same field; both varieties seemed to be affected about equally with rust, and during the past 3 years the rust has no doubt lowered the yield considerably. The Swedish oats also lodged quite badly nearly every year, but all other grain also went down, and thus it can not be said that some other variety has a stiffer straw, as they all seemed to be treated alike during some of our heavy storms, but I believe if the Swedish is given a fair chance it will stand up with any other variety grown. It has a somewhat coarser straw than some smaller varieties of yellow oats grown about here, and the kernel is also larger, but in comparing the inside of the kernel it will hold its own with any variety regardless of color, as the hull is very thin, thus increasing the feeding value considerably.

The demand for pure seed from this variety has been exceptionally good during the past few years, and we have always sold all we had to offer for seed at a fair price and have not only sold to growers in the neighborhood, but have shipped a considerable quantity to other farmers, as well as carloads to seed houses. It is just as easy to grow pure seed of any variety, and there is certainly more profit and pleasure connected with it.

Mr. Charles H. Howitt, of Randolph, Dodge County, Wis.:

We have been growing the Swedish oats for the past 4 years. In the spring of 1904 I secured 1½ bushels of seed from L. L. Olds Seed Company. This was sown on three-fourths of an acre of ground alongside of our common variety. The soil was of a heavy clay nature. There was a difference to be seen all through the growing season, the Swedish being of a darker green color and seemed to make a heavier growth. About 10 days before ripening they lodged quite badly on account of a storm, and accordingly the grain that we thrashed was rather light weight. The yield was at the rate of 50 bushels per acre.

The following spring we sowed 8 acres of the Swedish and 6 acres of our common variety in separate fields on the same kind of soil and both following a crop of barley. The Swedish yielded a trifle over 50 bushels per acre and the common variety 40 bushels per acre, a difference of 10 bushels in favor of the Swedish oats. The past 2 years we have grown the Swedish oats entirely for our main crop, with very satisfactory results.

The Swedish oats are now grown quite extensively in our neighborhood, and from what I have been able to learn from those who have grown them they seem to be the best adapted to a well-drained heavy soil.

QUALITY OF THE KERNEL IN THE SWEDISH SELECT OAT.

Soon after the introduction of the Swedish Select oat, many Wisconsin farmers remarked on the quality of the kernel, mentioned the thinness of the hull, and considered it to be in several respects an improvement over other kinds. (Pl. IV.) Our own investigations

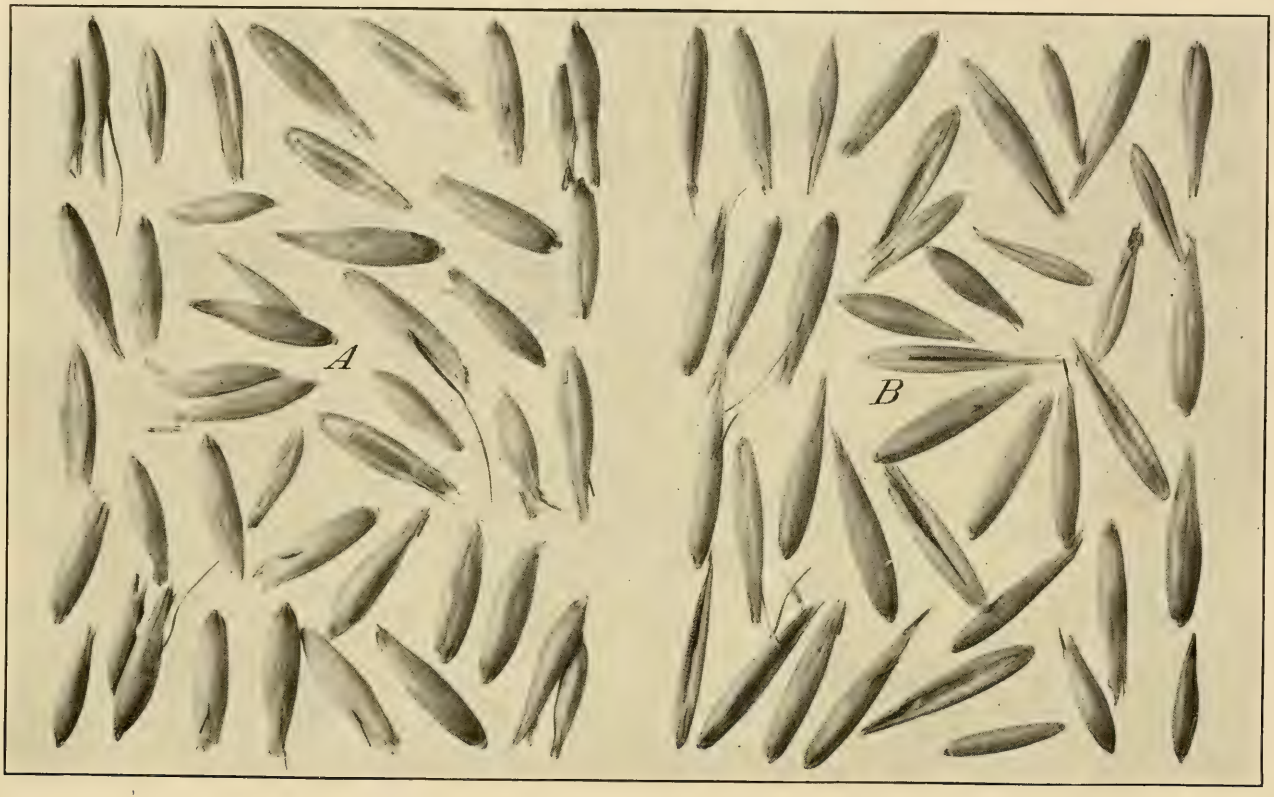
later have shown that several other varieties exceed the Swedish Select both in weight per bushel and proportion of meat to hull, but a larger number of varieties are inferior to it in these characteristics, and particularly so in the case of Wisconsin oats. Compared with the more commonly grown varieties, therefore, it remains true that this kernel stands rather high in quality in the chief oat districts of the United States.

The following interesting determinations were furnished by Mr. C. W. Warburton, now in charge of oat investigations of the Bureau of Plant Industry. The weight per bushel, the weight of 1,000 kernels, and the percentage of meat in the kernel were determined in samples of a number of different oat varieties grown in Wisconsin, Kansas, North Dakota, and Montana, with results as given in the following table:

TABLE VII.—*Weight per bushel, weight of 1,000 grains, and percentage of kernel to whole grain in a number of different oat varieties grown in several States.*

WISCONSIN.

	1905.	1906.	1907.	Average.
Kherson.				
Weight per bushel (pounds)	35.50	33.75	25.25	31.50
Weight of 1,000 grains (grams)	22.19	18.75	12.68	17.87
Percentage of meat in kernel	78.07	70.08	65.65	71.27
Sixty-Day.				
Weight per bushel (pounds)	30.50	29.25	26.25	28.67
Weight of 1,000 grains (grams)	18.85	16.88	13.97	16.57
Percentage of meat in kernel	72.60	73.74	66.45	70.93
Swedish Select.				
Weight per bushel (pounds)	34.00	36.50	27.50	32.67
Weight of 1,000 grains (grams)	24.25	29.71	23.84	25.93
Percentage of meat in kernel	70.09	69.63	67.44	69.05
White Bedford.				
Weight per bushel (pounds)	35.50		24.50	30.00
Weight of 1,000 grains (grams)	21.65		17.70	19.67
Percentage of meat in kernel	73.42		65.83	69.62
White Tartar.				
Weight per bushel (pounds)	32.50		27.00	29.75
Weight of 1,000 grains (grams)	19.84		19.38	19.61
Percentage of meat in kernel	69.13		69.86	69.49
Belyak.				
Weight per bushel (pounds)	35.50		26.00	30.75
Weight of 1,000 grains (grams)	25.98		17.41	21.69
Percentage of meat in kernel	70.35		67.38	68.86
Wisconsin Wonder.				
Weight per bushel (pounds)	33.50		23.00	28.25
Weight of 1,000 grains (grams)	23.73		17.33	20.53
Percentage of meat in kernel	70.16		63.71	66.93
Golden Fleece.				
Weight per bushel (pounds)		29.50	22.25	26.00
Weight of 1,000 grains (grams)		19.28	15.47	17.37
Percentage of meat in kernel		57.55	66.17	61.86
N. K. & Co. White.				
Weight per bushel (pounds)		23.75	19.75	21.75
Weight of 1,000 grains (grams)		22.78	15.74	19.26
Percentage of meat in kernel		54.86	59.61	57.24



KERNELS OF SWEDISH SELECT (*A*) AND LINCOLN (*B*) OATS.

(About one and one-half times natural size.)

TABLE VII.—*Weight per bushel, weight of 1,000 grains, and percentage of kernel to whole grain in a number of different oat varieties grown in several States*—Continued.

MONTANA.[a]

	1906.	1907.	Average.
Sixty-Day.			
Weight per bushel (pounds)	39.00	35.75	37.37
Weight of 1,000 grains (grams)	24.44	22.64	23.54
Percentage of meat in kernel	77.64	76.05	76.84
Swedish Select.			
Weight per bushel (pounds)	40.25	38.75	39.50
Weight of 1,000 grains (grams)	32.89	29.82	31.35
Percentage of meat in kernel	77.69	71.40	74.54
Salzer's Big Four.			
Weight per bushel (pounds)	40.25	41.00	40.62
Weight of 1,000 grains (grams)	28.54	29.06	28.80
Percentage of meat in kernel	76.30	70.75	73.52
Siberian.			
Weight per bushel (pounds)	42.00	41.25	41.62
Weight of 1,000 grains (grams)	32.99	33.86	33.42
Percentage of meat in kernel	70.99	75.46	73.22
Clydesdale.			
Weight per bushel (pounds)	40.25	41.00	40.62
Weight of 1,000 grains (grams)	31.72	30.59	31.15
Percentage of meat in kernel	75.28	69.36	72.32
Progress.			
Weight per bushel (pounds)	41.50	40.75	41.12
Weight of 1,000 grains (grams)	30.52	29.78	30.15
Percentage of meat in kernel	72.35	72.29	72.32

[a] All samples of grain from Montana contained a considerable percentage of hulled kernels; hence, the weight per bushel is somewhat higher than the grain itself justifies.

NORTH DAKOTA.

	1906.	1907.	Average.
Sixty-Day.			
Weight per bushel (pounds)	38.25	35.75	37.00
Weight of 1,000 grains (grams)	19.44	22.22	20.83
Percentage of meat in kernel	75.29	75.81	75.55
Seventyfive-Day.			
Weight per bushel (pounds)	.....	36.00	.....
Weight of 1,000 grains (grams)	.....	24.01	.....
Percentage of meat in kernel	.....	73.45	.....
Swedish Select.			
Weight per bushel (pounds)	37.50	34.00	35.75
Weight of 1,000 grains (grams)	30.14	28.84	29.49
Percentage of meat in kernel	69.49	70.78	70.23
Tartarian.			
Weight per bushel (pounds)	.....	31.00	.....
Weight of 1,000 grains (grams)	.....	23.08	.....
Percentage of meat in kernel	.....	68.15	.....
Belyak.			
Weight per bushel (pounds)	.....	31.75	.....
Weight of 1,000 grains (grams)	.....	26.48	.....
Percentage of meat in kernel	.....	67.58	.....
North Finnish Black.			
Weight per bushel (pounds)	.....	30.00	.....
Weight of 1,000 grains (grams)	.....	21.19	.....
Percentage of meat in kernel	.....	66.40	.....

KANSAS, 1907.

	Weight per bushel.	Weight of 1,000 grains.	Meat in kernel.
	Pounds.	*Grams.*	*Per cent.*
Sixty-Day	34.50	20.27	75.85
Early Champion	29.25	17.44	74.32
White Russian	27.25	20.31	72.63
Kherson	26.50	17.46	72.45
Swedish Select	38.75	32.01	72.19
Red Rustproof	27.75	25.75	70.54
Stavropol	25.25	17.33	69.92
Silver Mine	26.25	21.79	68.62
Minnesota, No. 202	25.25	19.34	67.87
Canadian	28.50	21.85	60.84

The percentage of meat in the kernel was determined by hulling 100 kernels taken at random from a fair sample, weighing the hulls and inside portions separately, and then calculating the percentage of the latter weight to the combined weight. An average of three such determinations for each sample gave the result that is set down for each variety each year.

The largest amount of data was obtained from Wisconsin material. Of the varieties examined from that State, the Swedish Select stands much the highest in weight per bushel in an average of samples from 3 years' crops, the average weight for this oat being 32.67 pounds. Only one other variety, the Kherson, reached even 31 pounds. In weight of 1,000 kernels in grams the Swedish Select also exceeds any of the others. This quality, however, is not important. In percentage of meat in the kernel this variety falls considerably below those having the highest percentages, ranking only fifth in this respect. The Kherson and the Sixty-Day are considerably higher, while the White Bedford and the White Tartar are also somewhat higher.

Average determinations of Montana samples out of two years' crops show the Swedish Select to be inferior in weight per bushel to four others in a comparison with five varieties. In weight of 1,000 kernels it stands second in rank, and, what is more important, is second also in percentage of meat in the kernel.

In the case of the North Dakota varieties there are averages of 2 years' samples in only two instances, those of the Sixty-Day and the Swedish Select, the latter exceeding the former in both weight per bushel and weight of 1,000 kernels, but falling considerably below it in percentage of meat in the kernel. For the 1907 crop only, the Swedish Select is exceeded by the Seventyfive-Day oat in both weight per bushel and percentage of meat, but exceeds the latter in weight of 1,000 kernels, and exceeds all the three remaining varieties in all these qualities.

Kansas samples were examined from only one year's crop, that of 1907. Compared with nine other kinds, the Swedish Select ranks fifth in percentage of meat, falling considerably below the Sixty-Day in this quality, but exceeds all other varieties in both weight per bushel and weight of 1,000 kernels.

A series of tests similar to the above was made by Shepperd and Churchill with a considerable number of varieties at the North Dakota Agricultural Experiment Station, samples being taken from the crops of 1904, 1905, and 1906.[a]

The results of these tests show that the Swedish Select stands considerably above the average of oat varieties in percentage of meat in

[a] Bulletin 75, North Dakota Agricultural Experiment Station, February, 1907, pp. 317–322.

the kernel, but considerably below the best in this respect, the Sixty-Day and the Tartarian being usually the best. In average weight per bushel it was good and stood rather high in weight of 1,000 kernels.

On the whole, the tests just mentioned indicate that the Swedish Select oat is usually high in weight per bushel and very high in absolute weight of kernels. At the same time, the percentage of meat in the kernel is found to be higher than might be expected, always above the average, and sometimes unusually high. The combination of these qualities therefore indicates that the feeding value from these standpoints is much above the average.

CHEMICAL ANALYSES.

For comparison, many chemical analyses of this oat and of others have been made by Dr. J. S. Chamberlain, formerly of the Bureau of Chemistry of this Department, in connection with laboratory work in cooperation with this Bureau. These analyses[a] show no extreme quality in the Swedish Select, but indicate that it is a variety of good feeding value, possessing a protein content above the average and a narrow nutritive ratio; that is, the ratio of protein to carbohydrates and fats is rather high. There is an unusually important feature of these analyses, however, in the fact that the average results with 128 samples of domestic-grown Swedish Select oats show a considerable increase in protein content over the original introduced seed. This is very gratifying, in view of the claim sometimes made that introduced crops, although an improvement at first, tend to deteriorate afterwards.

VALUE OF THE INTRODUCTION.

As previously mentioned, the Swedish Select oat has received the greatest attention in Wisconisn, though also grown to a large extent in South Dakota and Montana. It has been shown that the 10-year average yield of this oat at the Wisconsin Agricultural Experiment Station was 8½ bushels greater than the average of all other varieties. Also, calculating the averages of the highest yielding varieties for several different periods, in which all varieties were grown every year, there is a constant difference in yield of about 12 bushels per acre in favor of the Swedish Select in comparison with the next highest variety. Taking the mean of these two determinations, or, rather, reducing the latter one (for it is the most accurate), we can probably safely assume a constant average increase in yield of at least 10 bushels per acre for the Swedish Select over that of other varieties in these tests.

As all varieties were grown under the same conditions it is reason-

[a] See "The Feeding Value of Cereals," Bulletin 120, Bureau of Chemistry, U. S. Dept. of Agriculture, 1909, pp. 18–25.

able to infer that the Swedish Select oat will show the same superiority over ordinary kinds when grown throughout the State. It will therefore be interesting to calculate the possible increase in oat production in Wisconsin if this oat were grown exclusively. The average oat acreage of Wisconsin has recently been about 2,400,000 acres, and the average production about 80,300,000 bushels. The proportion of this production that is already Swedish Select is 30,000,000 bushels, or nearly three-eighths of the crop. With the same yield per acre, this portion would be grown on nearly three-eighths of the acreage, but of course it is really less. For safety in calculation we will assume it to be just three-eighths. Then there remains five-eighths of the acreage, or about 1,500,000 acres, now sown to other varieties. Ten bushels on each of these acres, or in all 15,000,000 bushels at least, would therefore be added to the present oat production of Wisconsin if Swedish Select oats were grown exclusively.

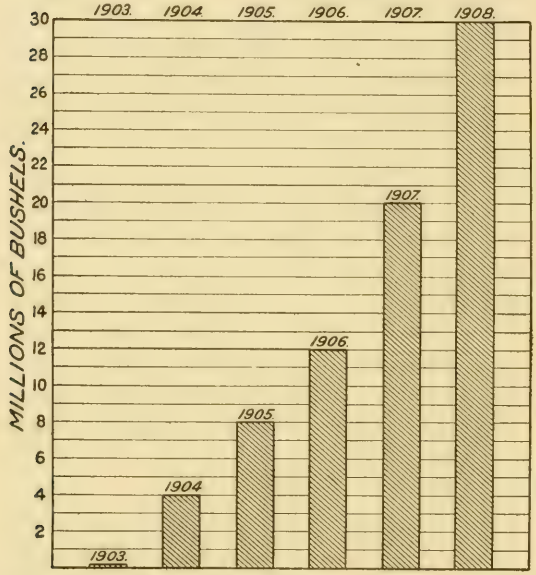


FIG. 3.—Diagram showing in millions of bushels the rapid increase in the production of Swedish Select oats in Wisconsin from 1903 to 1908.

Now, what is the actual present increase in production in Wisconsin due to the use of this oat? As stated, the present Swedish Select acreage is less than three-eighths of the total. Again, for safety in calculation we may assume it to be at this time at least one-fourth, or 600,000 acres. Ten bushels increase on each of these acres, or, 6,000,000 bushels in all, is therefore the present annual addition to the oat production of Wisconsin that can conservatively be credited to the use of the Swedish Select. The value of this increase in production at 36 cents per bushel, the average farm price December 1 for the years 1904–1908, is $2,160,000. The average farm price for 1907, 1908, and 1909, however, was 44 cents per bushel, which would increase the value to $2,640,000. Add to this the facts that the 6-million-bushel increase is reckoned up to 1908 only and that this extra production no doubt continues to be somewhat greater each year, and it is seen that the present increase in farm value

is probably not far from $3,000,000 annually, and certainly over $2,500,000, but the more conservative figures will be used.

The estimated production of the Swedish Select oat in Wisconsin ranges from 150,000 bushels in 1903 to 30,000,000 bushels in 1908. This rapid increase is shown graphically in figure 3. Figure 4 shows the average farm value of the entire oat crop of Wisconsin, that of the Swedish Select oat alone, and the increase in farm value of the entire crop due to the use of the Swedish Select variety.

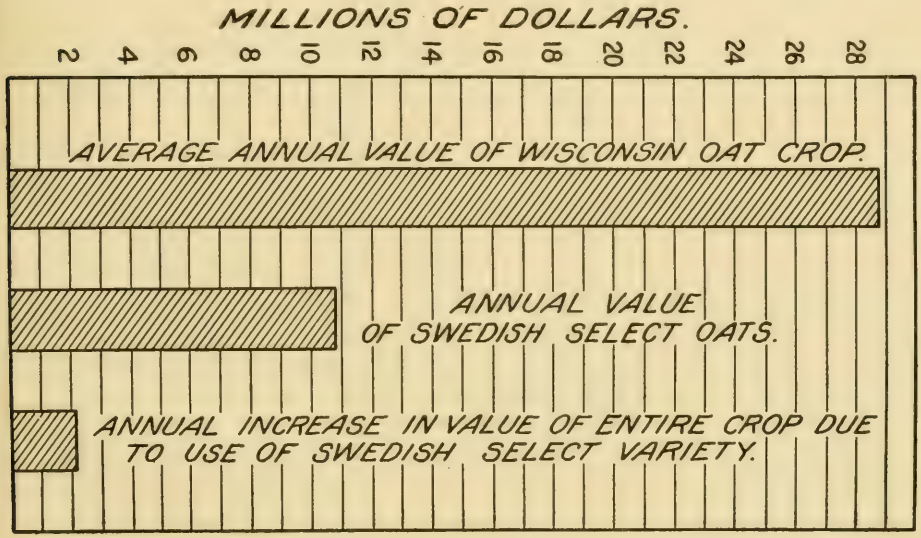


FIG. 4.—Diagram showing in millions of dollars the average farm value of the entire oat crop in Wisconsin, that of the Swedish Select oat, and the annual increase in the farm value of the entire crop due to the use of the Swedish Select variety.

Outside of the State of Wisconsin the present production of the Swedish Select oat is more difficult to estimate, but, as already stated in the introduction, the entire production in the United States is surely 50,000,000 bushels annually. Using this figure, the present farm value of the Swedish Select oat at the average farm price per bushel for the years 1904–1908 is at least $18,350,000 annually.

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